MATTEL ELECTRONICS

January 17, 1980

Philips Engineering
% Mr. Ken Scott
Radofin Electronics

Dear Sir:

Enclosed are documents that specify the requirements of a PAL color circuit for the Mattel Electronics Intellivision Master Component. It is my understanding that Mr. Scott has already discussed the possibility of Philips developing a color circuit to meet these requirements. If the enclosed information is not sufficient please call me or send a telex indicating the type of information you need. My phone and telex numbers are below.

Sincerely,

Brian P Dougherty

Brian Dougherty
Design Engineer
Ext. 1262

BD/lw

enclosures

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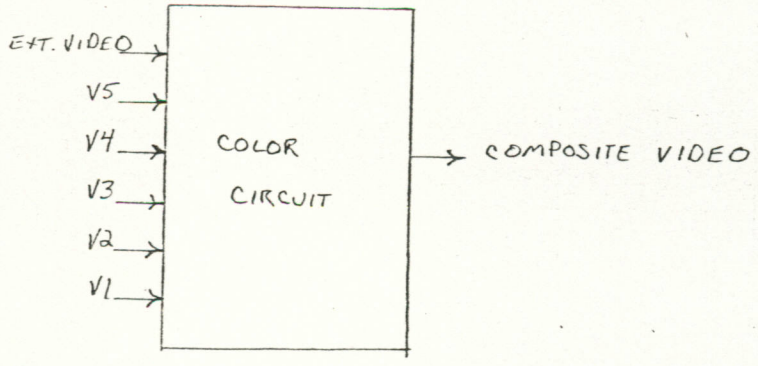
THE BASIC REQUIREMENT, FOR THE INTELLIVISION PAL COLOR CIRCUIT, IS THAT IT BE ABLE TO ACCEPT A 5 BIT INPUT AND GENERATE A COMPOSITE VIDEO SIGNAL SUITABLE FOR INPUT TO A UHF MODULATOR. THE FIGURE BELOW SHOWS THE BASIC FUNCTIONAL BLOCK. THE SIXTH INPUT BIT, LABLED EXT. VIDEO IS USED IN THE GENERATION OF HIGH RESOLUTION GRAPHICS. AS FAR AS THE COLOR CIRCUIT IS CONCERNED, WHEN THE EXT. VIDEO BIT IS HIGH THE LUMINENCE OF THE CURRENT COLOR IS TO BE CHANGED BY APROXIMATELY 33%, EITHER INCREASED OR DECREASED DEPENDING ON THE COLOR, (SEE CODE SHEET).



THE VIDEO TIMING IS INHERENT IN THE FIVE BIT VIDEO INPUT. FOR EXAMPLE THE CODES REQUESTING SYNCH AND COLOR BURST ARE PRESENTED AT THE APPROPIATE TIMES AND HAVE THE APPROPIATE DURATION.

THE FOLOWING DATA SHEETS GIVE THE CODE INFORMATION AND COLOR DIFFERENCE SIGNALS FOR THE COLORS MATTEL CURRENTLY HAS IN THE NTSC VERSION OF THE GAME. IT IS ESSENTIAL THAT THE PAL IMPLEMENTATION COME AS CLOSE TO THESE COLORS AS POSSIBLE.

6.0 INPUT CODE ASSIGNMENT

V5	V4	V3	V2	V1	LUMINENCE CHANGE ON EXT. VIDEO HIGH	COLOR OUTPUT DESCRIPTION	
0	0	0	0	0	+ 33% (OF WHITE)	Black	GROUP A
0	0	0	0	1	+ 33%	Blue	
0	0	0	1	0	- 33%	Red	
0	0	0	1	1	- 33%	Tan	
0	0	1	0	0	+ 33%	Grass Green	
0	0	1	0	1	- 33%	Green	
0	0	1	1	0	- 33%	Yellow	
0	0	1	1	1	- 33%	White	
0	1	0	0	0	- 33%	Gray	GROUP B
0	1	0	0	1	- 33%	Cyan	
0	1	0	1	0	- 33%	Orange	
0	1	0	1	1	+ 33%	Brown	
0	1	1	0	0	- 33%	Magenta	
0	1	1	0	1	- 33%	Light Blue	
0	1	1	1	0	- 33%	Yellow-Green	
0	1	1	1	1	+ 33%	Purple	
1	X	X	0	0		Blanking	
1	X	X	1	0		Color Burst	
1	X	X	0	1		Sync	
1	1	1	1	1		Test	

LINE 2342

THEORETICAL MATTEL I & Q VALUES & CONVERSION TO COLOR DIFFERENCE SIGNALS.

COLOR	$\hat{I}$	$\hat{Q}$	Y	R-Y	B-Y
BLACK	0	0	0	0	0
BLUE	-.733	.066	0.33	-0.66	0.923
RED	.666	.20	0.523	0.76	-0.395
TAN	.266	-.133	0.715	0.17	-0.520
GRASS GREEN	-.133	-.60	0.413	-0.5	-0.874
GREEN	-.20	-.533	0.577	-0.52	-0.686
YELLOW	.533	-.333	0.853	0.30	*-1.15
WHITE	0	0	1.0	0	0
GRAY	0	0	0.55	0	0
CYAN	-.533	-.266	0.66	-0.67	0.136
ORANGE	.533	-.066	0.687	0.468	-0.701
BROWN	.266	-.266	0.33	0.089	-0.747
MAGENTA	0.4	.667	0.55	0.796	0.693
LT. BLUE	-.40	.40	0.66	-0.134	*1.12
YELLOW-GREEN	.066	-.533	0.687	-0.267	-.980
PURPLE	.133	.533	0.44	0.458	0.760
BURST	.266	-.266	0	0.089	-0.747

* USING THE EQUATION $B-Y = -1.106\,I + 1.703\,Q$ CAUSES SOME CONVERTED VALUES TO EXCEED UNITY.
$R-Y = 0.956\,I + 0.621\,Q$

APROXIMATE PHASE INFORMATION BASED ON CALCULATED R-Y & B-Y VALUES